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Original Study

Applicability of PIRADs 2.1 scoring system to screen Prostate Cancer in a Ugandan population, a cross-sectional study.

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Abstract

Background/Objectives:

Prostate Cancer (PCa) is highly prevalent in Africa. The Prostate Imaging Reporting and Data System (PIRADS) is used for detecting, staging, standardizing the acquisition, and reporting of BI-Parametric Magnetic Resonance Imaging (MRI) (Bp-MRI). The PIRADS is a "living" document and, through research, should be tested and validated for different healthcare settings. There is hardly any literature on the applicability and accuracy of the PIRADS 2.1 to screen for PCa in sub-Saharan Africa. The study sought to assess the applicability of the PIRADS 2.1 scoring system to screen PCa in sub-Saharan Africa.

Methods:

A retrospective review of imaging requisitions was done, including Bp-MRI, MRI reports, and histology reports, including the Gleason score, at an imaging institution in Uganda. The study assessed the ability of PIRADS alone, PIRADS and prostate specific antigen density (PSAD), PIRADS and Apparent Diffusion Coefficient (ADC), and PIRADS, PSAD, and ADC-combination to discriminate a positive histological prostate case. The study used the Area Under the Curve to determine the ability of PIRADS 2.1 to discriminate PCa.

Results:

The study reviewed 234 patient records, and of these, 99 were aged 65-74 years, and 48.7% were PCa histology-confirmed cases. PIRADS alone had an AUC 0.70, a combination of PIRADS V2.1 and PSAD had an AUC score 0.73, while a combination of PIRADS V2.1, PSAD, and ADC had an AUC 0.72.

Conclusions:

The accuracy of PIRADS for PCa discrimination is acceptable with an AUC 70%. Predominantly peripheral zone location, together with the low Gleason score and the background changes of chronic prostatitis, may account for the low PIRADS cancer prediction.

Keywords: *Prostate; cancer; Magnetic Resonance Imaging (MRI); Sub-Saharan Africa; BI-Parametric Magnetic Resonance Imaging (MRI); Prostate Imaging Reporting and Data System (PIRADS), Prostate Cancer; Uganda.*
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Introduction

Prostate Cancer (PCa) has been shown to be highly incident (29.7 per 100,000 population) in Africa [1]. It is the commonest cancer in men in Uganda, and its incidence is rising at a rate of 5.2% per annum. In an effort to lower such a rate, early screening and detection, especially among the at-risk population, have been shown to be effective, especially in low-resource settings like Uganda [2]. A number of tools, including the Digital Rectal Examination(DRE), serum Prostate-Specific Antigen (PSA), a nonspecific blood test, and Trans-Rectal Ultrasound (TRUS)–guided biopsy have been used to screen and detect PCa [3]. While these different tools have been used successfully, they have been found to have varying shortcomings, prompting innovations such as Magnetic Resonance Imaging (MRI) being implemented. Prostate MRI has been shown to increase the accuracy of tumor screening, detection, and localization, and recently, its use has been on the rise, even in low-resource settings. [4]. BpMRI has been recognized as a safe and valuable imaging modality in PCa detection, staging, and active surveillance, with detection rates comparable to those of (multi-parametric) mpMRI. [5]. A systematic review done by Bass et al indicated that the sensitivity for any cancer detection was 0.84 (95% CI, 0.80–0.88), specificity 0.75 (95% CI, 0.68–0.81), and the summary ROC curve yielded a high AUC value (AUC = 0.86). The Meta-regression analysis revealed no difference in the pooled diagnostic estimates between bpMRI and mpMRI [6].
To facilitate global standardization and reduce variation in the acquisition, interpretation, and reporting of prostate MRI, the Prostate Imaging Reporting and Data System

(PIRADS) was introduced [7]. The PIRADS was first introduced as version 1 by the European Society of Urogenital Radiology (ESUR) in 2012 and later improved through joint efforts by the American College of Radiology (ACR), the ESUR, and the AdMeTech Foundation to form Version 2. A further upgrade in 2019 resulted in version 2.1, which is currently used. PIRADS V2.1 and bpMRI have been shown to have good accuracy in screening for clinically significant prostate cancer, with one meta-analysis giving pooled sensitivity and specificity of 87% and 74 %, respectively [8]. Combining the different clinical and MRI parameters, like Prostate Specific Antigen Density and ADC, has been found to enhance the accuracy of bpMRI. A study done by Distler et al found that a combination of PIRADS and PSAD yields high accuracy for PCa screening. Such a combination improves on the negative predictive value of the PIRADS scoring system, thus yielding more accurate detection rates [9, 10]. Although PI-RADS scoring is generally a reliable tool for detecting prostate cancer, some clinically significant cancers can still be missed [11]. The PIRADS scoring system is intended to be a living document, informed by and building on clinical experience and research worldwide. It should therefore be tested and validated for different healthcare settings. There is hardly any literature on the applicability and accuracy of the PIRADS 2.1 scoring system in screening for PCa in sub-Saharan Africa.

PIRADS scoring was adopted in our center in Kampala, Uganda, in April 2016 and has been routinely used to screen for patients requiring prostate biopsy for PCa for the past 5 years. Our protocol utilizes bi-parametric MRI, omitting the use of dynamic contrast enhancement for DCE to make the examination more affordable for individuals within our resource-limited setting. This retrospective study aimed to determine how PIRADS 2.1 accurately predicts PCa in a Ugandan population.

Materials and Methods

This study obtained ethical approval and waiver of consent from the Mengo Hospital Research and Ethics Committee (MHREC) number MH/REC/03/02/2020 prior to commencement. The study retrospectively reviewed prostate imaging requisitions, prostate bpMRI images, prostate MRI reports, and prostate histology reports, including the Gleason score. The study employed a cross-sectional retrospective study. The study was carried out at Ernest Cook University radiology department, an imaging institution in Uganda. The review covered the period between July 2017 and December 2021. The inclusion criteria were patients presenting for MRI prostate screening within the study period, for whom the required clinical, laboratory, histology, and MRI data were available. We excluded patients with incomplete or missing key data, including clinical, laboratory (e.g., PSA), histology, or MRI findings required for analysis. A total of 234 participants met the study criteria. Patients had been referred based on one or more of the following: high PSA, suspicious digital rectal examination (DRE), positive family history, and suspicious nodule on trans-rectal ultrasound (TRUS) prostate examination.

Data collection

The BpMRI images used for the current study had been obtained using a Phillips 1.5 Tesla Achieva (Philips Medical Systems Nederland BV. P.O Box 90050, 5600PB Eindhoven, The Netherlands) with surface body coils. The slice thickness used was 3mm. The Diffusion Weighted Imaging employed a b-value of 1500-2000s/mm2. The images, stored in a Picture Archiving and Communication System (PACS) system, were retrieved, re-read, and graded using PIRADS V2.1 by two radiologists with three to five years' experience in PIRADS application, and agreed by consensus on the PIRADS scores. The DICOM Clear Canvas workstation version 2.0 12729.37986 SPI was used. Imaging reports were rewritten using a structured report template for consensus and standardization between 2 radiologists. Biopsy results were reviewed, and the Gleason scores were documented. Biopsy was performed using trans-rectal ultrasound (TRUS) guidance based on the MRI reports. Clinical, demographic, and laboratory information were abstracted from the patients' imaging requisitions, which included demographic data, PSA, prostate volume, the histopathological diagnosis, and the Gleason score.

We assessed the ability of PIRADS alone, PIRADS and prostate-specific antigen density (PSAD), PIRADS and Apparent Diffusion Coefficient (ADC), and PIRADS, PSAD, and ADC-combination in predicting a positive histological cancer prostate case.

To minimize bias, only records with complete key variables were included in the primary analysis, and consecutive sampling of all patients meeting eligibility criteria was used, rather than convenience sampling, to ensure representativeness.

Statistical analysis

Data was exported to STATA version 15 (StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LLC) for analysis. Baseline characteristics were summarized using frequencies and proportions. The PSA density (PSAD calculated by PSA Density (ng/ml2) = PSA / Volume) was categorized as: <0.07, 0.08-0.15, and >0.15. The applicability of PIRADS V 2.1 as a screening test for PCa was determined by the Area Under the curve (AUC) (15) for PIRADS V2.1 alone and then in combination with PSAD and ADC one at a time. A logistic regression model was also developed using a combination of PIRADs, PSAD, and ADC, and compared to combinations of PIRADs and PSAD, PIRADs and ADC. This was done to determine which of the 3 models better discriminates a positive case from a non-PCa case. The patient's histopathology results were used as a gold standard. (AUC). According to literature, most researchers consider AUC values lower than 0·6 as poor, but large variation exists for AUC values higher than 0·7. AUC values between 0·7 and 0·8 have been labelled as poor, moderate, fair, or good [12]. This was adopted for this study.

Results

In the study, we reviewed a total of 234 patient records, and of the majority, 42% (99) were aged between 65 and 74 years, as shown in Table 1

Table 1. Patient characteristics for PCa screening in a Ugandan population

Characteristic	PCa cases	PCa Non-cases
Participant Age category	No. (%)	No. (%)
45-54	8 (3%)	18 (8%)
55-64	31 (13%)	39 (17%)
65-74	51 (22%)	50 (21%)
75-above	24 (10%)	13 (6%)
Gleason score		
6	63 (27%)	0 (0%)
7	33 (14%)	0 (0%)
8	9 (4%)	0 (0%)
9	9 (4%)	0 (0%)
PIRADS score		
2	16 (7%)	43 (18%)
3	29 (12%)	42 (18%)
4	22 (9%)	25 (11%)
5	47 (20%)	10 (4%)
Prostatitis		
Prostatitis case	69 (29%)	87 (37%)
Prostatitis non case	45 (19%)	33 (14%)
PSAD		
<0.07	90 (38%)	100 (43%)
0.07-0.15	12 (5%)	17 (7%)
>0.15	12 (5%)	3 (1%)
Location		
TZ	28 (12%)	52 (22%)
PZ	40 (17%)	36 (15%)
Both	44 (19%)	31 (13%)
All	2 (1%)	1 (0%)

Proportion of PCa cases

Out of the total number (234) of patient records reviewed, 114 (48.7%) were PCa histology-confirmed cases (Figure 1), with the majority (44.4%) aged between 65 and 74 years. Out of the total number of cases (114), 33.3% had cancer located in both the transitional and peripheral zone (Table 1).

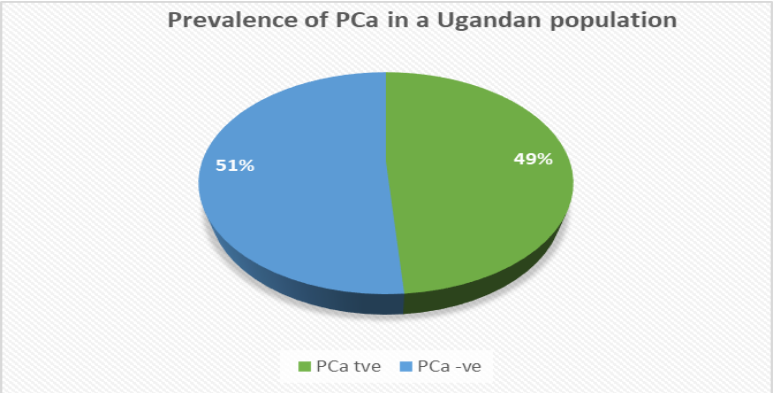

Figure 1: Prevalence of PCa in a Ugandan population

Ability of PIRADS scoring, PSAD, and ADC in discriminating prostate cancer

The results indicated that out of 114 PCa cases, 41% (47) had a PIRADS score of 5, while 14% (16) had a PIRADS score of 2 (Table 2).

Table 2: Table showing histology results per PIRADS score in a Ugandan population

Histology	PIRADS SCORE				Total
	2	3	4	5	
Negative	43	42	25	10	120
Positive	16	29	22	47	114
Total	59	71	47	57	234

Accuracy of PIRADS to discriminate PCa

The AUC was found to be 0.71(95% CI 0.64-0.77) (Table 3 and Figure 2). This implies that the curve and the corresponding AUC show that PIRADS V2.1 as a screening tool has an acceptable predictive ability to discriminate PCa cases from non-PCa cases in Uganda

Table 3: Table showing histology results per PIRADS score in a Ugandan population

Histology	Coef.	Std. Err.	Z	P>|Z|	95%CI
PIRADS	0.8	0.13	5.6	0.000	0.5-1
Cons	-2.7	0.48	-5.5	0.000	-3.6—1.7

Number of observations = 234

Area Under ROC Curve (AUC) = 0.71

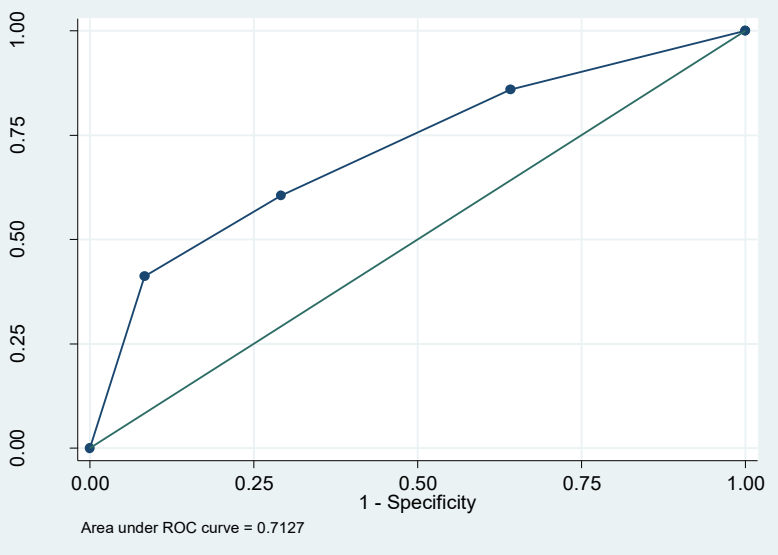

Figure 2: PIRADS V2_1 Predictive ability to discriminate PCa in the Ugandan population

Combining PIRADS V2.1 and PSAD

The logistic model, which consists of a combination of PSAD and PIRADS V2.1, had an AUC score of 0.71 (Table 4 and Figure 3). The combination of PSAD and PRIADS V2.1 had an acceptable predictive ability to discriminate PCa cases from non-cases in Uganda.

Table 4: logistic regression model showing a combination of PIRADS and PSAD to discriminate PCa in a Ugandan Population

	Coeff	Std. Err.	z	P>|Z|	95% CI
PIRADS	0.75	1.4	5.5	0.000	0.48-1
Density	0.24	0.2	0.9	0.38	-0.26-0.72
cons	-2.9	0.6	-5.2	0.000	-4—1.8

Number of observations = 234
Area Under ROC Curve (AUC) = 0.71

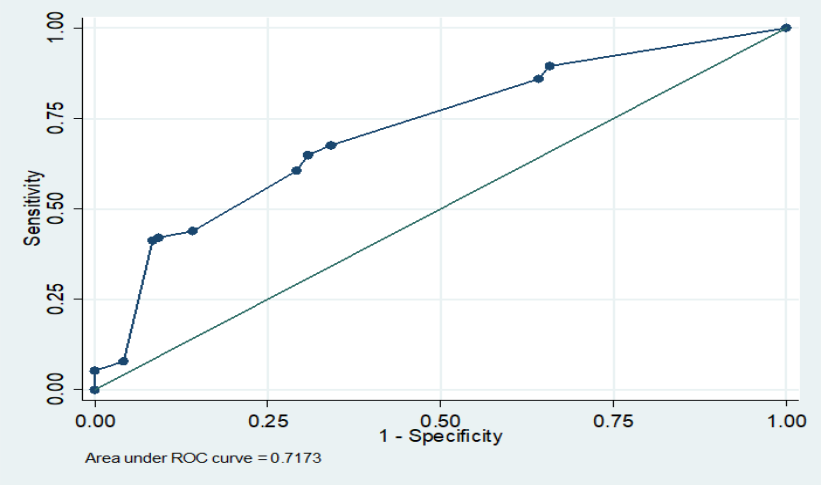

Figure 3: PIRADS V2_1 and PSAD Predictive ability to discriminate PCa in a Ugandan population

Combining PIRADS V2.1 and ADC for discriminating PCa

From Table 5 to Figure 4, the logistic model, which consists of a combination of PIRADS V2.1 and PSAD, had an AUC score of 0.73. The combination of PSAD and PRIADS V2.1 had an acceptable predictive ability to discriminate PCa cases from non-cases in Uganda.

Table 5: Logistic regression model combining PIRADS V2.1 and ADC to discriminate PCa in a Ugandan population

	Coeff	Std. Err.	z	P>|Z|	95% CI
PIRADS	0.64	0.15	4.3	0.000	0.35-0.94
ADC	-0.002	0.0009	-2.7	0.008	-0.004-0.0006
cons	-0.62	0.9	-0.7	0.5	-2.4—1.1

Number of observations=210
AUC=0.73

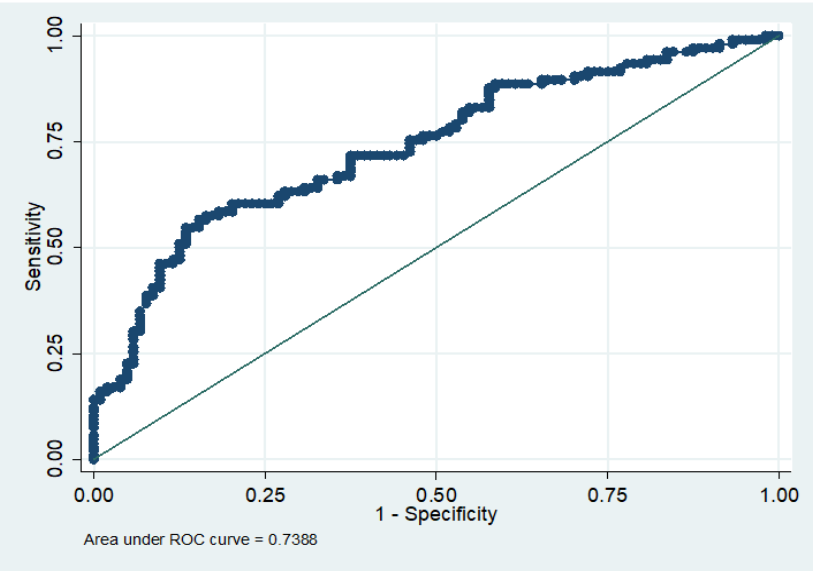

Figure 4: PIRADS V2_1, PSAD, and ADC Predictive ability to discriminate PCa in a Ugandan population

Combining PIRADS V2.1, PSAD, and ADC to discriminate PCa

From Table 6 and Figure 5, the logistic model, which consists of a combination of PIRADS V2.1, PSAD, and ADC, had an acceptable predictive ability of AUC, 0.74, to discriminate PCa cases from non-cases in Uganda, similar to PIRADS V2.1 alone; PIRADS V2.1 and PSAD; PIRADS V2.1 and ADC; and PIRADS V2.1, ADC, and PSAD.

Table 6: logistic regression model combining PIRADS V2.1, PSAD, and ADC to discriminate PCa in a Ugandan population

Histology	Coeff	Std. Err.	Z	P>|Z|	95% CI
PIRADS	0.64	0.15	4.3	0.000	0.34-0.93
ADC	-0.002	0.0009	-2.6	0.009	-0.004-0.0005
Density	-0.03	0.27	-0.1	0.9	-0.5-0.6
cons	-0.67	1	-0.749	0.5	-2.6—1.3

Number of observations = 210
Area under ROC curve = 0.74

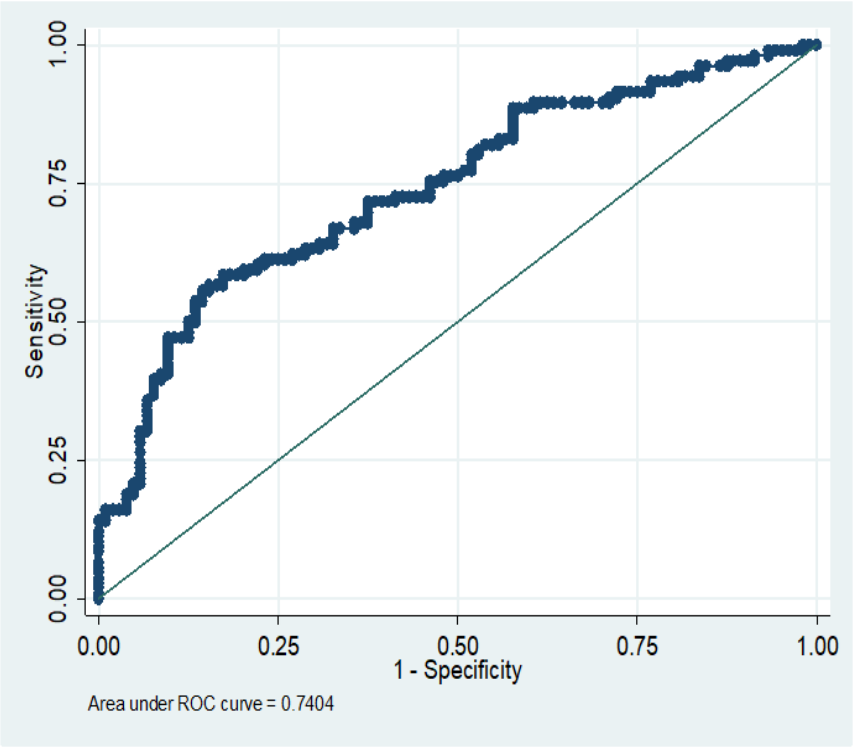

Figure 5: PIRADS V2_1, PSAD, and ADC Predictive ability to discriminate PCa in a Ugandan population

Comparison of the 3 models (PIRADS V2.1 and PSAD; PIRADSV2.1 and ADC; and PIRADSV2.1, ADC, and PSAD)

The results in Table 7 and Figure 6 indicate that the equality of the area under the curve using the Chi-square test yielded a p-value of 0.09, suggesting that there is no statistically significant discrimination ability among these three models, as further emphasized by the area under the curve.

Table 7: Comparison of the 3 models' (PIRADS V2.1 and PSAD; PIRADSV2.1 and ADC; and PIRADSV2.1, ADC, and PSAD) ability to discriminate PCa in a Ugandan population

	obs	ROC Area	Std. Err.	Asymptotic Normal(95% conf. interval)
Xb1	210	0.73	0.03	0.67-0.80
Xb2	210	0.71	0.04	0.64-0.78
Xb3	210	0.74	0.03	0.67-0.80

H0: area (xb1) =area(xb2) =area(xb3)
Chi2=4.77 Prob>chi2=0.09

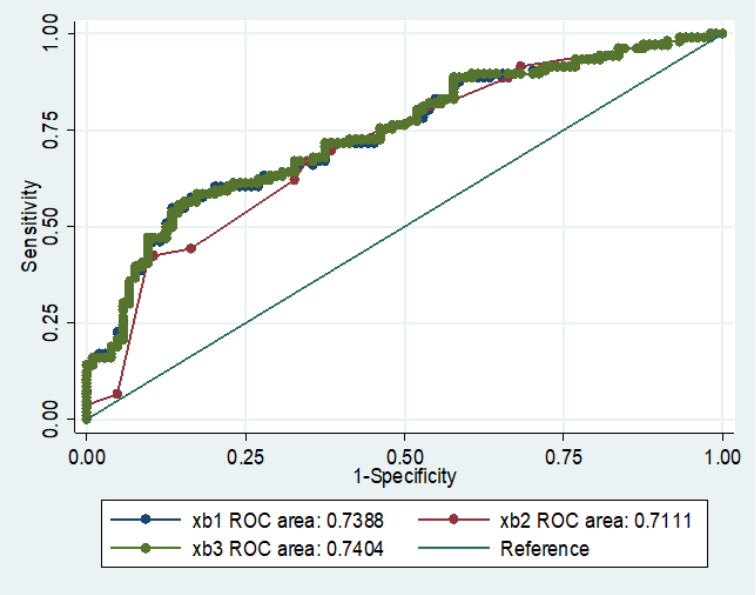

Figure 6: Comparison of the three models' (PIRADS V2.1 and PSAD; PIRADSV2.1 and ADC; and PIRADSV2.1, ADC, and PSAD) Predictive ability to discriminate PCa in a Ugandan population.

Discussion

Based on the study findings, the majority (52) of prostate cancer cases occur in individuals aged 65-74 years. While a definitive causal relationship has not yet been established in Uganda, these results are consistent with findings from other studies.[13, 14]. In addition, the majority (81%) of the patients had a low PSAD <0.07. This may be explained by the fact that most of these patients were reporting for screening purposes as a result of an increased trend in awareness of PCa in the Ugandan population. Such increased awareness could ultimately lead to improved health-seeking behavior like early screening, which is a precursor to the reduced rate of distant PCa metastases and later better treatment outcomes[15]. A cross sectional study done in Kenya demonstrated that in their study, participants who were aware of prostate cancer screening were more likely to take up early screening (OR = 8.472; 95% CI: 1.554-46.186; P = 0.014) (19) Such increased awareness could ultimately lead improve health seeking behavior like early screening which is a precursor to the reduced rate of distant PCa metastases and later better treatment outcomes (20).

Furthermore, 49% of the participants had PCa confirmed by biopsy, and out of these, 41% had a PIRADS score of 5. The high frequency of positive biopsies within PIRADS 5 lesions is in support of the indication to biopsy PIRADS 5 lesions as per PIRADS version 2.1[16]. Additionally, we found that of the 114 PCa confirmed cases, 25 (22%) had a PIRADS 3 score and 16 (14%) had a PIRADS 2 score. The high frequency of positive biopsies within PIRADS 3 lesions is in support of the indication to biopsy PIRADS 3 lesions as per PIRADS version 2.1, while the relatively high proportion of positive biopsies among PIRADS 2 patients (16, 14%) suggests that a negative MRI would still need follow-up, possibly with serial PSA, and may necessitate a saturation biopsy.

The findings reveal that the majority of cancers are localized to the PZ (33 cases) more than the TZ (23). This aligns with the 49% which were found the impact of Zone of Origin in Anterior Dominant Prostate Cancer study (22). This finding may be explained by the fact that the peripheral zone of the prostate contains the majority (70%) of glandular tissue in this gland. More so, the peripheral zone surrounds much of the central zone, as well as part of the distal urethra [17]

From the study, the results indicated that the most common Gleason score was 6 (55.3%). This score is much lower than the findings in a study done to analyze long-term trends in Gleason grading in a nationwide population by Daniela et al in Sweden. In this Swedish study, they found that from all biopsy specimens, the commonest (57%) Gleason score was 7-10 category[18]. This relatively low Gleason score implies that PCa is likely to be less conspicuous at MRI when using DWI and ADC, since there is a relationship between Gleason score and DWI, especially since there is a demonstrable correlation between quantitative ADC scores and Gleason score[19, 20]. This low Gleason score could therefore account for the slightly lower accuracy (AUC) of PIRADS in detecting PCa in our population. A relationship between the aggressiveness of PCa (based on Gleason score) and the ADC has been proposed[21, 22]. The predominance of Gleason 6 lesions in our series may indicate that we are dealing with less aggressive PCa, with better treatment outcomes, but at the moment, there are no longitudinal studies to support this postulation.

Our results indicate that the AUC for PIRADS alone was 0.71. This score is lower than that found in other studies. A study done by Moritz et al in a cohort of 82 patients found an AUC score of 0.83[23] while Guan et al found 0.935[24]. This finding may be explained by the fact that the majority of the cases had a Gleason score of 6 and were localized both in the peripheral and Transition zones. Some of these localized tumors have been shown to be infiltrative tumors and are frequently missed on MRI [25].

The findings also show that PIRADS in combination with PSAD, the AUC score was 0.71. This finding may be

explained by the fact that the majority of our cases had MRI features of chronic prostatitis, which is known to raise PSA levels[26]. The finding differs from that found by Florian et al among men at the University Hospital Heidelberg, in which they found an AUC score of 0.79[9]. The AUC is also lower compared to that found in a retrospective study among 526 men, where when PIRADS was combined with PSAD, the AUC score increased to 0.83 among 526 men without known prostate cancer [27].

Furthermore, it was found that when PIRADS was combined with ADC, the AUC score was 0.73. This result may be explained by the fact that the majority of our PCa cases have a PIRADS 5 score, and ADC values are known to best help to diagnose clinically significant lesions, which are assigned a PI-RADS 4, or above [10]. The AUC score indicates that the discrimination ability has improved as much as compared to using PIRADS alone. This is similar to a study by Lin et al., who in their study compared PIRADS V2, ADC histogram parameters, and their combination to diagnose PCa in the peripheral zone. They found that adding ADC parameters to PI-RADS V2 scores didn't improve diagnostic ability [28].

More still, when PIRADS, PSAD, and ADC were combined, we found an AUC score of 0.72. This inability to improve on the discrimination may be justified by chronic prostatitis, since the majority of our patients showed MRI features of chronic prostatitis. The MRI features of chronic prostatitis may also mimic PCa [29]. Our AUC findings are lower than those in most studies, which show an AUC of 75-85%. The results have not demonstrated an advantage of combining several parameters to enhance the discriminative ability to detect PCa, a finding different from that of Lin et al [30]

Generalizability of findings

This was a retrospective analysis from a single referral center, which might have introduced bias into the results. Since the nodules were retrospectively analyzed and all patients underwent targeted biopsy prior to PIRADS v2.1, our results may not represent the natural prevalence and distribution of 'atypical' nodules in the general population. Additionally, the study had patients with likely advanced disease, leading to spectrum bias.

More still, ROC AUC has been mentioned to be the most useful in the early stages of test assessment, whereas methods based on net benefit are more useful to assess radiological tests where the clinical context is known. This is also cited as a study limitation.

Conclusions

Uganda has one of the world's highest incidences of PCa. Age at presentation is similar to other regions. Patients are starting to report early for screening with PSA and MRI. The accuracy of PIRADS prediction for PCa is acceptable with an AUC of 71%. Most cancers at screening are in the peripheral zone, and the majority are Gleason 6. Low Gleason scores for a significant proportion of patients and the background changes of chronic prostatitis may account for the low PIRADS cancer prediction rates.

Limitations

This was a single-site study and, as such, may reflect site-specific characteristics such as patient demographics, disease severity, and referral patterns.

Recommendations

To combine PI-RADS scoring with clinical and laboratory parameters, such as PSA density, ADC, age, family history, and DRE findings, rather than relying on PI-RADS alone. There is a need to develop and incorporate local MRI interpretation guidelines that explicitly consider background changes, such as chronic prostatitis, which may mimic or obscure prostate cancer. More still, to explore the integration of artificial intelligence models to aid decision making and MRI interpretation to improve detection accuracy in the presence of prostatitis.

Author Contributions:

"Conceptualization, M.K and S. K; methodology, M.K and RM; investigation, S.K., H.D. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author, [MK]. The data are not publicly available due to [restrictions, e.g., their containing information that could compromise the privacy of research participants].

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Conflicts of Interest

The authors declare no conflicts of interest.

Author biography

Professor Michael Kawooya is a Professor of Radiology and a senior academic clinician with over 30 years of practice and academia in diagnostic imaging, medical education, and health systems strengthening in low- and middle-income settings. His work has focused on advancing radiology practice, imaging-based diagnosis, and capacity building, particularly in resource-limited environments. He has played a leading role in postgraduate training, research supervision, and the development of imaging services, with interests spanning MRI, ultrasound, and quality improvement in diagnostic

care. Professor Kawooya has contributed significantly to regional and international collaborations aimed at improving access to safe, effective, and appropriate medical imaging in sub-Saharan Africa.

Richard Malumba is a public health researcher with training in Health Services Research and interests in epidemiology and biostatistics. His work focuses on disease surveillance, diagnostic pathways, and the application of data-driven and artificial intelligence methods to priority health challenges in low- and middle-income settings. He has conducted research on infectious and chronic diseases, including tuberculosis, prostate cancer, chronic respiratory diseases, and HIV-related conditions. His research emphasizes improving screening, risk stratification, and health system performance using routinely collected health data, with a particular focus on strengthening evidence to inform clinical practice and policy in sub-Saharan Africa.

Professor Samuel Kaggwa is a senior Ugandan surgeon and urologist with extensive expertise in prostate cancer, general surgery, and surgical education. He is a Professor of Surgery at Makerere University and a Senior Consultant Urologist at Mulago Hospital and Mengo Hospital. His research focuses on improving surgical outcomes in resource-limited settings, including refinements in open retropubic radical prostatectomy and preoperative prostate assessment. He has led and co-investigated studies on urinary continence recovery, prostate volume measurement, and health system strategies to expand access to essential surgical services. Prof. Kaggwa is actively involved in postgraduate teaching, mentorship, and regional capacity building in urology and surgery.

Dr. Samson Lubowa K. Kamya is a radiologist and medical imaging specialist with extensive experience in clinical diagnostic radiology and hospital-based imaging services. Dr. Kamya has also served as an assistant lecturer at Makerere University and held administrative and clinical roles at Mulago and Rubaga Hospitals. His training includes apprenticeships in pediatric and MR imaging, a Master's degree in Medicine from Makerere University, and a Postgraduate Diploma in Management from UMI Kampala. He is actively engaged in community service and professional mentorship in Uganda**.**

Dr. Henry Musinguzi Dabanja is a Ugandan urologist and clinician-scientist specializing in urologic oncology. He is currently a Consultant Urologist and Head of Surgical Urologic Oncology at the Uganda Cancer Institute and a visiting urologist at Kampala Hospital. Dr. Dabanja holds a Fellowship in Urologic Oncology (UCI–UCSF) and a Master of Medicine in General Surgery (Makerere University). His work focuses on clinical care, surgical training, and research in urology, with interests in prostate and bladder cancers, reconstructive urology, and minimally invasive techniques. He has presented and published research internationally and actively contributes to surgical education and capacity building in sub-Saharan Africa.

Abbreviations

The following abbreviations are used in this manuscript:

ADC	Apparent Diffusion Coefficient
AUC	Linear dichroism
Bp-MRI	BI-Parametric Magnetic Resonance Imaging
Pca	Prostate Cancer
PIRADS	Prostate Imaging Reporting and Data System
PSAD	Prostate Specific Antigen Density
PZ	Peripheral Zone
TZ	Transition Zone

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